

CLAIMS

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1. A mechanical construction of a mobile telecommunication device, comprising
 - a printed circuit board,
 - a keypad,
 - a display,
 - a reader for a detachable memory module,
 - an outer cover consisting of at least two parts, and
 - a frame construction into which said printed circuit board, keypad, display, reader
 10 for a detachable memory module and outer cover parts are mechanically coupled.
 2. A mechanical construction according to claim 1, wherein said frame construction defines a battery compartment for removably attaching a battery pack, and said frame construction comprises means for removably attaching one of said
 15 outer cover parts to cover said battery compartment.
 3. A mechanical construction according to claim 2, wherein said frame construction
 - is essentially flat comprising a first side and a second side whereby said battery
 20 compartment is on the first side and the printed circuit board is to be attached on the second side, and
 - defines a battery connector shaft as a passage connecting said battery compartment to said second side.
 - 25 4. A mechanical construction according to claim 3, additionally comprising a separate battery connector inserted into said battery connector shaft, and in said battery connector a first set of connection springs for providing an electrical connection to a battery pack and a second set of connection springs, electrically coupled to said first set of connection springs, for providing an electrical connection
 30 to the printed circuit board.
 5. A mechanical construction according to claim 1, wherein said frame construction defines a switch compartment for housing a switch operable from the outside of the frame construction and separately attachable to the frame
 35 construction.

6. A mechanical construction according to claim 1, wherein said frame construction defines a vibrational alarm device compartment for housing a vibrational alarm device separately attachable to the frame construction.

5 7. A mechanical construction according to claim 1, wherein said frame construction comprises an integrated holder, made of the same piece with the rest of the frame construction, for holding a removably attachable memory module.

10 8. A mechanical construction according to claim 7, wherein said frame construction is essentially flat defining a planar direction, and said integrated holder defines a planar slot in said planar direction and comprises a pair of tongues for limiting said planar slot in a direction perpendicular to said planar direction and a wart for reducing the free dimensions of said planar slot in said planar direction.

15 9. A mechanical construction according to claim 7, comprising, next to said integrated holder, a memory module reader with a first set of connection springs for connecting to the printed circuit board, a second set of connection springs for connecting to a detachable memory module and conductor means for electrically coupling said first and second sets of connection spring to each other.

20 10. A mechanical construction according to claim 9, wherein the form of said memory module reader defines a hollow space within the total area limited by said first set of connection springs.

25 11. A mechanical construction according to claim 1, wherein said frame construction comprises an essentially planar surface and a set of ridges protruding from it for attaching the printed circuit board onto said ridges parallelly to said essentially planar surface but separated from it and so that said ridges divide the space between said essentially planar surface and a printed circuit board so attached
30 into at least two separate subspaces.

12. A mechanical construction according to claim 11, wherein said essentially planar surface and said ridges are electrically conductive for providing electromagnetic shielding to said subspaces.

35 13. A mechanical construction according to claim 12, wherein said ridges comprise at their protruding edge an elastic conductive gasket layer for sealing the printed circuit board against said ridges.

14. A mechanical construction according to claim 1, wherein the keypad is a separately assembled stack of layers comprising a front cover part defining a set of key openings, an elastic keymat with a protruding key bulb corresponding to each key opening in said front cover part, and a dome sheet with an elastically deformable conductive dome corresponding to each key bulb in said elastic keymat.

15. A mechanical construction according to claim 14, wherein said elastic keymat is translucent to light at a certain visible wavelength for providing lighting to the keypad using the elastic keymat as a light conductor.

16. A mechanical construction according to claim 15, wherein said front cover part is generally non-transparent to light at visible wavelengths but comprises an area which is transparent to light at said certain visible wavelength for allowing light to pass from said elastic keymat through said area to that side of the front cover part which is not against said elastic keymat.

17. A mechanical construction according to claim 16, wherein said area transparent to light at said certain visible wavelength is located next to a certain key opening and has the form of a human-readable character for indicating the function of a key corresponding to said certain key opening.

18. A mechanical construction according to claim 14, wherein the keypad additionally comprises, between said front cover part and said elastic keymat, at least one key hat covering the protruding part of a key bulb.

19. A mechanical construction according to claim 18, wherein

- said elastic keymat is translucent to light at a certain visible wavelength for providing lighting to the keypad using the elastic keymat as a light conductor,
- said key hat is generally non-transparent to light at visible wavelengths but comprises an area which is transparent to light at said certain visible wavelength for allowing light to pass from said elastic keymat through said area to that side of the key hat which is not against said elastic keymat and
- said area transparent to light at said certain visible wavelength has the form of a human-readable character for indicating the function of a key corresponding to said key hat.

20. A mechanical construction according to claim 14, wherein the keypad additionally comprises an insulating adhesive film layer on that side of said dome sheet which is not against said elastic keymat.

5 21. A mechanical construction according to claim 14, wherein said front cover part comprises a set of pins with protruding ends and said elastic key mat and said dome sheet define a set of holes corresponding to said set of pins for assembling the keypad by bringing said front cover part, said elastic keymat and said dome sheet together so that said pins go through said holes.

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22. A mechanical construction according to claim 1, wherein the display is a separately assembled stack of layers comprising a window, a liquid crystal display unit and a bottom plate.

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23. A mechanical construction according to claim 22, wherein one of the outer cover parts of the mobile telecommunication device defines a display opening and has a certain thickness at the edge of said display opening, and said window comprises a portion elevated by said certain thickness for filling said opening so that in an assembled mechanical construction an outer surface of the aggregate formed by said outer cover part and said window is essentially even.

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24. A mechanical construction according to claim 22, further comprising a reflector at one planar surface of the bottom plate for conveying light into the liquid crystal display unit.

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25. A mechanical construction according to claim 22, wherein the bottom plate defines an opening and the display additionally comprises an elastomeric conductor arrangement for connecting electric signals through said opening into said liquid crystal display unit.

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26. A mechanical construction according to claim 22, comprising, at the edges of said display, mechanical means for aligning the display in relation with the printed circuit board.

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27. A mechanical construction according to claim 26, wherein said mechanical means additionally attach the display to the printed circuit board and/or to said frame construction.

28. A method for assembling a mobile telecommunication device, comprising the steps of

- providing a frame construction,
- converting said frame construction into a frame subassembly by attaching into it a volume switch, a volume key, a battery connector, an external connections connector, a vibrating alarm device and a set of springs and latches for controlling the movement of parts that are to be movable in an assembled mobile telecommunication device,
- providing a printed circuit board with a significant part of the electronically functional components of the mobile telecommunication device attached thereto,
- providing a previously assembled display module comprising a window, a display panel and a bottom plate,
- providing a reader for detachable memory means,
- providing a set of outer cover parts,
- providing a previously assembled keypad module and
- assembling the mobile telecommunication device by inserting said reader for detachable memory means into said frame subassembly, attaching said printed circuit board to the frame subassembly, attaching said display module and said keypad module on top of said printed circuit board and attaching said outer cover parts to the aggregate comprising said frame subassembly, reader for detachable memory means, display module and keypad module.